

WHAT IS CLAIMED IS:

1. A method of identifying a stem cell comprising:
 - (a) obtaining a cell sample which contains a stem cell; and
 - (b) detecting the expression of BCRP by a cell in the cell sample; wherein a cell that expresses BCRP is identified as a stem cell.
2. The method of Claim 1 wherein said detecting is performed with an antibody that binds to BCRP; and wherein a stem cell is identified if it binds to said antibody.
3. The method of Claim 1 wherein said detecting is performed with a PCR probe for the nucleic acid that expresses BCRP.
4. The method of Claim 1 wherein said detecting is performed by measuring the pumping activity of the cell; wherein a stem cell is identified if it can remove Hoechst 33342 dye, but not Rhodamine 123 dye.
5. The method of Claim 1 further comprising:
 - (c) detecting the expression of a cell marker associated with stem cells; wherein a cell that expresses BCRP and expresses the cell marker is identified as a stem cell.
6. The method of Claim 5 wherein said cell marker is selected from the group consisting of EM10, CD34, Thy-1, P-gp, Ac133, and c-kit.
7. The method of Claim 5 wherein said cell marker is CD34 and wherein the cell is also CD38⁺.
8. The method of Claim 1 further comprising
 - (c) detecting the expression of a lineage specific marker; wherein a cell that expresses BCRP but does not express the lineage specific marker is identified as a stem cell.

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9. The method of Claim 8 wherein said stem cell is a hematopoietic stem cell and the lineage specific marker is selected from the group consisting of CD2, CD3, CD4, CD8, CD14, CD15, CD16, CD19, CD20, CD33, CD38, CD56, CD71, HLA-DR, and glycophorin A.

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10. A method of isolating a cell that expresses BCRP comprising:

- (a) obtaining a cell sample which contains a cell that expresses BCRP;
- (b) detecting the expression of BCRP by a cell in the cell sample; and
- (c) isolating the cell that expresses BCRP.

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11. A method of isolating a cell that expresses BCRP comprising:

- (a) obtaining a cell sample which contains a cell that expresses BCRP;
- (b) contacting the cell sample with an antibody that binds to BCRP; and
- (c) isolating a cell from the cell sample that binds to said antibody;

15 wherein the isolated cell is a cell that expresses BCRP.

12. The method of Claim 11, wherein said isolating is performed by flow cytometry.

20 13. The method of Claim 12, wherein said antibody has a fluorescent label and said isolating is performed by fluorescence-activated cell sorting.

14. An isolated stem cell obtained by the method of Claim 11.

25 15. A cell population enriched for stem cells obtained by a method comprising:

(a) obtaining a mixed population of cells which comprises both stem cells and cells that are not stem cells; and

(b) separating the cells of the mixed population of cells into two individual groups of cells based on whether they do or do not express BCRP; wherein the group

30 of cells that express BCRP is a cell population enriched for stem cells.

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16. An antibody that recognizes an extracellular portion of a BCRP; wherein said extracellular portion of the BCRP is in its natural conformation.

17. The antibody of Claim 16 wherein the BCRP is on the surface of a viable stem cell.

18. A method for determining the amount of BCRP expressed in a human subject having or suspected of having leukemia comprising:

- (a) obtaining a leukemic cell from the subject; and
- (b) determining the amount of BCRP expressed in the leukemic cell.

19. The method of Claim 18, wherein the leukemia is acute myelogenous leukemia (AML).

20. The method of claim 19 wherein the leukemic cell is a blast cell.

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